

## 50-06-04 Log Data Report

### Borehole Information:

<b>Borehole:</b> 50-06-04 (299-W10-110)			<b>Site:</b> T Tank Farm			
<b>Coordinates</b> (Hanford)		<b>GWL (ft)<sup>1</sup>:</b> N/A <sup>2</sup>		<b>GWL Date:</b> N/A		
<b>North</b>	<b>East</b>	<b>Drill Date</b>	<b>TOC<sup>3</sup> Elevation</b>	<b>Total Depth (ft)</b>	<b>Type</b>	
43531.0	-75780.0	June 1973	671.3 ft	93.0	Cable Tool	

### Casing Information:

<b>Casing Type</b>	<b>Stickup (ft)</b>	<b>Outer Diameter (in.)</b>	<b>Inside Diameter (in.)</b>	<b>Thickness (in.)</b>	<b>Top (ft)</b>	<b>Bottom (ft)</b>
Welded steel	0	6 5/8	6	0.280	0	unk

The logging engineer measured the casing using a steel tape; measurements were rounded to the nearest 1/16 in. Casing thickness is based on published values for ASTM schedule-40 steel pipe.

### Borehole Notes:

The borehole coordinates, elevation, and borehole depth information listed above are from *Hanford Wells* (Chamness and Merz 1993). The logging engineer measured depth to water and depth to bottom using an e-tape before logging. Depth to bottom was 93.0 ft. The borehole was dry. Zero reference = top of casing. Top of casing is cut mostly even. No reference point survey mark was available.

### Logging Equipment Information:

<b>Logging System:</b>	Gamma 2F (NMLS)	<b>Type:</b>	Neutron moisture gauge
<b>Calibration Date:</b>	11/13/2001	<b>Calibration Reference:</b>	GJO-2002-291-TAR
		<b>Logging Procedure:</b>	MAC-HGLP 1.6.5, Rev. 0

### Neutron Moisture Logging System (NMLS) Log Run Information:

<b>Log Run</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Date	10/16/02	10/16/02			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	92.75	45.0			
Finish Depth (ft)	0.25	35.0			
Count Time (sec)	N/A	N/A			
Live/Real	R	R			
Shield (Y/N)	N/A	N/A			
MSA Interval (ft)	0.25	0.25			
ft/min	1 ft/min	1 ft/min			
Pre-Verification	BF013CAB	BF013CAB			
Start File	BF013000	BF013371			
Finish File	BF013370	BF013411			
Post-Verification	BF014CAA	BF014CAA			
Depth Return Error (in.)	N/A	-1			

Log Run	1	2	3	4	5
Comments	No fine-gain adjustment.	Repeat section.			

### **Logging Operation Notes:**

Data were collected using Gamma 2, HO 68B-3572. The logging vehicle was set up facing northwest. A centralizer was installed on the sonde. File BF013322 at 12.25 ft had anomalous gross counts. The logging cable fell off an end wrap on the drum causing an increase in depth and consequently more counting time through that particular interval. NMLS pre-run and post-run verification spectra were collected at the beginning and end of each day.

Preliminary gross count plots were prepared in the field.

### **Analysis Notes:**

<b>Analyst:</b>	McCain	<b>Date:</b>	10/22/02	<b>Reference:</b>	GJO-HGLP 1.6.3, Rev. 0
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NMLS spectra were processed in batch mode using APTEC Supervisor to generate files of gross counts as a function of spectrum file name and depth. An EXCEL spreadsheet was used to prepare preliminary gross count plots and to calculate and plot gross count rates. Gross count rates for the verification spectra were within acceptance criteria. Because this log is part of a group of four boreholes with differing casing configurations, no attempt was made to calculate moisture content. The log plots are qualitative; the primary use is correlation. In general, increasing neutron count rates are indicative of increasing moisture content.

### **Log Plot Notes:**

NMLS gross count rates are plotted as a function of depth, using EXCEL's graphing capabilities. Logs are plotted at a consistent depth and count rate scale to facilitate comparison and correlation.

### **Results and Interpretations:**

The neutron log shows an abrupt decrease in count rate at 40 to 41 ft, which corresponds with the bottom of the tank farm excavation. Neutron peaks at 43.25, 49.0, 57.25, 60.5, 62.5, 71, and 80.5 ft may indicate elevated moisture content associated with thin silt layers within the Hanford formation. Increasing neutron counts beginning at approximately 82 ft probably correspond to finer material in the early Palouse unit. The decrease in neutron counts at approximately 90-ft depth appears to correlate with a caliche layer at the top of the Plio-Pleistocene unit.

### **References:**

Chamness, M.A., and J.K. Merz, 1993. *Hanford Wells*, PNL-8800, prepared by Pacific Northwest Laboratory for the U.S. Department of Energy, Richland, Washington.

U.S. Department of Energy, 1999. *Hanford Tank Farms Vadose Zone, Tank Summary Data Report for Tank T-106*, GJ-HAN-120, prepared by MACTEC-ERS for the Grand Junction Office, Grand Junction, Colorado, June.

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<sup>1</sup> GWL – groundwater level

<sup>2</sup> N/A – not applicable

<sup>3</sup> TOC – top of casing

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